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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/828,182	04/09/2001	Sang Gug Lee	LEES3002/EM/6681	7494

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EXAMINER
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NGUYEN, LEE

ART UNIT	PAPER NUMBER
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2682

DATE MAILED: 04/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/828,182

Applicant(s)

LEE ET AL.

Examiner

LEE NGUYEN

Art Unit

2682

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE \_\_\_\_\_ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,6 and 7 is/are rejected.
- 7) ☒ Claim(s) 2-5,8 and 9 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 April 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Priority***

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### ***Drawings***

2. Figures 1-5 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1 and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Tiller et al. (US 5,933,771).

Regarding claim 1, Tiller teaches a mixer (fig. 9), comprising:  
a first transistor Q1 for amplifying a radio frequency  
(RF) signal  $V_{in}$ ; a second Q3 and a third Q4 transistor, each connected  
to the first transistor Q1, for receiving a balanced local oscillator signal  
( $V_{io+}$ ,  $V_{io-}$ ) to mix it with the RF signal; a first and a second load element  
(see Load) connected between a supply voltage source (Positive Supply)  
and the second transistor Q3 and between the supply voltage source and  
the third transistor Q4, respectively; and a fourth transistor Q5, connected  
between the supply voltage source (Positive Supply) and the first transistor  
Q1, for amplifying the RF signal and bleeding a current from the supply  
voltage source (col. 7, lines 7-15).

Regarding claim 6, Tiller teaches a mixer (fig. 4), comprising:  
a first differential circuit including a first Q1 and a  
second Q2 transistor connected differentially to each other,  
for amplifying a balanced radio frequency (RF) signal ( $V_{in+}$ ,  $V_{in-}$ );  
a second differential circuit including a third transistor Q3 and a fourth  
transistor Q6 connected differentially  
each other, the third and the fourth transistor being  
connected to the first and the second transistor Q1, Q2,

respectively, for receiving a balanced local oscillator (LO) signal Vio+ to mix it with the balanced RF signal;

a third differential circuit including a fifth Q4 and a sixth Q5 transistor connected differentially to each other, the fifth and the sixth Q4, Q5 transistor being connected to the first and the second transistor Q1, Q2 and cross-coupled to the third and the fourth transistor Q3, Q6, respectively, for receiving a balanced local oscillator Vio- signal to mix it with the balanced RF signal;

a first and a second load element RC connected between a supply voltage source (Positive Supply) and the third transistor Q3 and between the supply voltage source (Positive Supply) and the sixth transistor Q6, respectively; and a fourth circuit including a seventh Q11 and an eighth transistor Q12, connected to the supply voltage source and the first differential circuit, for amplifying the RF signal and bleeding a current from the supply voltage source (col. 7, 7-15).

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tiller et al.

Regarding claim 7, Tiller fails to teach that each of the first through the sixth transistor is an N-channel MOSFET and each

of the seventh and the eighth transistor is a P-channel MOSFET.

However, as suggests by Tiller either NPN or PNP transistors can be used in his mixer (col. 8, lines 56-62). It would have been obvious to one of ordinary skill in the art at the time the invention was made to select either NPN or PNP transistors to the mixer of Tiller in order to simplify the circuit connection due to different polarities.

***Allowable Subject Matter***

8. Claims 2-5 and 8-9 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.


Regarding claim 2, the prior art of record fails to teach a gate and a drain of the fourth transistor are connected to a gate and a drain of the first transistor, respectively.

Regarding claim 8, the prior art of record fails to teach coupling capacitors between the gates of the first and the seventh transistor and the second and the eighth transistor, respectively.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LEE NGUYEN whose telephone number is (703)-308-5249. The examiner can normally be reached on 8:00 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, VIVIAN CHIN can be reached on (703) 308-6739. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

 4/14/04  
LEE NGUYEN  
Primary Examiner  
Art Unit 2682